

I claim:

1. A semiconductor chip carrier comprising:
  - a primary substrate;
- 5 a metal heat sink plate having a first side and an opposing second side where said primary substrate is attached to said first side; and
  - a supplemental substrate attached to said metal heat sink plate on said second side.
- 10 2. A semiconductor chip carrier according to claim 1, wherein said supplemental substrate is constructed from a material having substantially similar coefficient of thermal expansion as said primary substrate.
- 15 3. A semiconductor chip carrier according to claim 1, wherein said supplemental substrate is constructed from a same material as said primary substrate.
4. A semiconductor chip carrier according to claim 1, wherein said primary substrate is constructed from a material selected from one of Bis-malesimide triazine epoxy, FR4, polyimide, and polytetrafluoroethylene.
- 20 5. A semiconductor chip carrier according to claim 1, wherein said primary substrate is a ball-grid array chip carrier.
6. A semiconductor chip carrier according to claim 1, wherein said metal heat sink plate is a metal selected from one of Cu, Cu-W, Al and alloys thereof.
- 25 7. A semiconductor chip carrier according to claim 1, wherein said supplemental substrate has a Cu-Ni finish layer.
- 30 8. A semiconductor chip carrier according to claim 1, wherein said supplemental substrate has a cavity exposing a portion of said metal heat sink plate.
9. A semiconductor chip carrier comprising:
  - a primary substrate;

a metal heat sink plate having a first side and an opposing second side where said primary substrate is attached to said first side; and  
a supplemental substrate being attached to said second side of said metal heat sink plate, wherein said supplemental substrate is constructed from a material having a  
5 substantially similar coefficient of thermal expansion as said primary substrate.

10. A semiconductor chip carrier according to claim 9, wherein said supplemental substrate is constructed from a same material as said primary substrate.

10 11. A semiconductor chip carrier according to claim 9, wherein said primary substrate is constructed from a material selected from one of Bis-malesimide triazine epoxy, FR4, polyimide, and polytetrafluoroethylene.

12. A semiconductor chip carrier according to claim 9, wherein said chip carrier  
15 is a ball-grid array chip carrier.

13. A semiconductor chip carrier according to claim 9, wherein said metal heat sink plate consists of a metal selected from one of Cu, Cu-W, Al, and alloys thereof.  
20 14. A semiconductor chip carrier according to claim 9, wherein said supplemental substrate has a Cu-Ni finish layer.

15. A semiconductor chip carrier according to claim 9, wherein said supplemental substrate has a cavity exposing a portion of said metal heat sink plate.  
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16. A method of forming a semiconductor chip carrier, comprising:  
providing a metal heat sink plate having a first side and an opposing second side;  
attaching a primary substrate to said first side; and  
30 attaching a supplemental substrate to said second side of said metal heat sink plate, wherein said supplemental substrate is constructed from a material having substantially similar coefficient of thermal expansion as said primary substrate.

17. A process according to claim 16, wherein said supplemental substrate is  
35 constructed from a same material as said primary substrate.

18. A process according to claim 16, wherein said primary substrate is constructed from a material selected from one of Bis-malesimide triazine epoxy, FR4, polyimide, and polytetrafluoroethylene.

5           19. A process according to claim 16, wherein said chip carrier is a ball-grid array chip carrier.

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